

REMARKS

Applicants and the undersigned thank Examiner Winter for the courtesies extended in the telephonic interview of May 9, 2003. This Amendment is submitted in response to the issues discussed in the interview.

In the Office Action dated January 30, 2003, claims 1-58 were rejected. In the present response, claims 1, 2, 33, 50, 57, and 58 have been amended, and new claims 59-102 have been added. Therefore, claims 1-102 remain pending. Applicant acknowledges the withdraw of the 35 U.S.C. § 103(a) rejection of (i) claims 2-32, 34-49, and 51-56 in view of U.S. 6,280,481 to Storey-Laubach *et al.* ('481) in view of *SPIE Micromachining and Microfabrication*, Oct. 1996, to Dyck, *et al.* ("Article"); and (ii) claims 1-58 in view of *SPIE Micromachining and Microfabrication*, Oct. 1996, to Dyck, *et al.* ("Article") in view of U.S. 6,090,771 to Burt *et al.*

Applicant respectfully submits that no new matter has been added by this amendment. Support in the specification for the new and amended claims can be found in the specification at least on the following:

Support for amended claims 1, 2, 33, 50, 57, and 58, can be found at least on page 9, lines 7-9, and lines 17-21; on page 22, lines 15-18; and page 28, lines 17-21.

Support for new claim 59 can be found at least on page 11, line 9, to page 21, line 14.

Support for new claim 60 can be found at least on page 10, lines 14-15.

Support for new claim 61 can be found at least on page 10, lines 19-22; page 32, Table 3.

Support for new claim 62 can be found at least on page 27, lines 21-23.

Support for new claim 63 can be found at least on page 6, lines 12-15.

Support for new claim 64 can be found at least on page 6, lines 19-20.

Support for new claim 65 can be found at least on page 6, lines 12-15.

Support for new claim 66 can be found at least on page 31, lines 6-9.

Support for new claim 67 can be found at least on page 6, lines 19-20.

Support for new claims 68, 69, and 70 can be found at least on page 6, lines 15-18.

Support for new claim 71 can be found at least on page 9, lines 11-12.

Support for new claims 72 and 73 can be found at least on page 10, lines 15-18.

Support for new claims 74-89 can be found at least on pages 12-15, Table No. 1.

Support for new claims 90-102 can be found at least on pages 17-18, Table No. 2.

I. Claim Rejections Under 35 U.S.C. § 102(b)

(a) Claims 1, 2, 3, 11-18, 33, 42-49, 57, and 58

Claims 1, 2, 3, 11-18, 33, 42-49, 57, and 58 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,966,981, by Schultz (the '981 patent). The Office Action stated that the substrate in the '981 patent is food, and nothing in the claim precludes food from being the substrate.

Applicants respectfully traverse this rejection in light of the amended claims.

Reconsideration and withdrawal of this 35 U.S.C. § 102(b) rejection of claims 1, 2, 3, 11-18, 33, 42-49, 57, and 58 is respectfully requested in light of the amended claims.

(b) Claims 1-58

Claims 1-58 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,866,005, by DeSimone *et al.* (the '005 patent). The Office Action stated that the '005 patent at column 1, line 20 *et seq.*, discloses that prior art systems used liquid carbon dioxide to remove oils from substrates. The oil, even if not intended as cleaners would have the effect of dissolving oil soluble matter, and the subsequent dissolution of the oil in liquid carbon dioxide

would thus remove the oil, lacking here is the specific disclosure of the organic solvent. The Office Action further states that at column 3, line 19-41, the '005 patent discloses *inter alia* diethyl ether of the present invention, and goes on to state "the co-solvent or modifier can be used prior to, during, or after the substrate is contacted by the carbon dioxide fluid. Columns 3 through 18 disclose the various organic/silo-organic solvents.

Applicants respectfully traverse this rejection in light of the amended claims. Reconsideration and withdrawal of this 35 U.S.C. § 102(b) rejection of claims 1-58 is respectfully requested in light of the amended claims.

II. Rejection of Claims 1-58 Under 35 U.S.C. § 103(a)

Claims 1-58 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,370,742, by Mitchell (the '742 patent) and U.S. Patent No. 5,683,977, Jureller *et al.* (the '977 patent). The Office Action stated that:

The '742 reference discloses the steps of contacting a substrate (fabric) with *inter alia* an organic solvent... What is apparently not explicitly disclosed are all the claimed solvents, which are extracted with the carbon dioxide. The '997 reference discloses the various silo/organic solvents currently claimed. See specifically columns 5-16. The artisan would have [been] motivated to make the instant combination for the reasons explicitly set forth in '742, namely to avoid impeding the cleaning action. It is noted that the solvents would be selected for the reasons set forth as well, namely their compatibility with liquid carbon dioxide. Absent such compatibility the organic solvents are disclosed to potentially adhere to the substrate.

Applicants respectfully traverse this rejection in light of the amended claims. Reconsideration and withdrawal of this 35 U.S.C. § 103(a) rejection of claims 1-58 is respectfully requested in light of the amended claims.

CONCLUSION

With entry of the above Amendment and in view of the foregoing remarks, it is respectfully submitted that claims 1-102 are in condition for allowance.

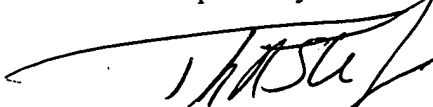
None of Applicants' amendments or cancellations are to be construed as dedicating any such subject matter to the public, and Applicants reserve all rights to pursue any such subject matter in this or a related patent application.

Submitted below is separate page titled "Version with Marking to Show Changes Made to the Claims," showing a marked-up copy of prior pending claims.

It is respectfully submitted in view of the foregoing Amendments and Remarks that all of the objections and rejections in the final Office Action dated January 30, 2003 have been overcome and should be withdrawn. Applicants respectfully request early and favorable notification to that effect.

If, in the opinion of the Examiner, a phone call may help to expedite prosecution of this application, the Examiner is invited to call Applicant's undersigned attorney at (312) 701-8775.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'T. Stiebel, Jr.', with a long horizontal flourish extending to the left.

Thomas R. Stiebel, Jr.
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Dated: May 30, 2003

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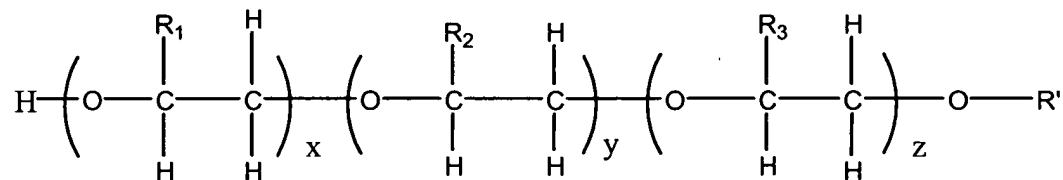
Version with Marking to Show Changes Made to the Claims

1. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

wherein the organic solvent is of the structural formula:



wherein x, y, and z each is zero or one;

at least one of x, y, and z is one;

R' is C_jH_{2j+1} wherein j is an integer between one and (13-3(x+y+z)), inclusive; and

R₁₋₃ are independently H or CH₃;

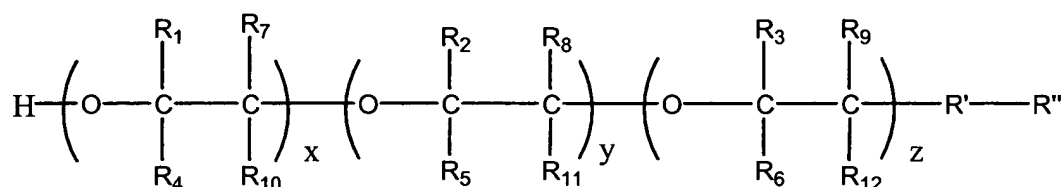
wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].

2. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

wherein the organic solvent is of the structural formula:



wherein x, y, and z each is zero or one;

at least one of x, y, and z is one;

R'' is benzyl, phenyl, partially or fully fluorinated benzyl or phenyl, C_jH_{2j+1}, or C_jH_aF_b

wherein j is an integer between one and (13-3(x+y+z)), inclusive, a and b each is independently an integer between zero and 2j+1, inclusive, and a+b=2j+1;

R₁₋₁₂ are independently C_mH_nF_p or C_dH_eF_g where m is an integer between zero and two, inclusive, n and p are integers between zero and five, inclusive and n+p=2m+1, d is an integer between zero and two, inclusive, e and g are integers between zero and five, inclusive, and e+g=2d+1; and

R' is O, S, carbonyl or ester;

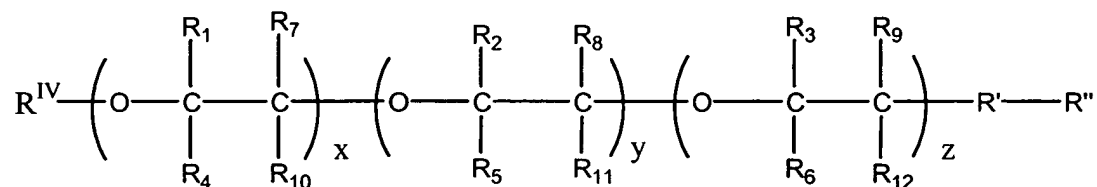
wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].

33. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

wherein the organic solvent is of the structural formula:



wherein x, y, and z each is zero or one;

at least one of x, y, and z is one;

R'' is C_jH_{2j+1} or $C_jH_uF_v$ and R^{IV} is C_kH_{2k+1} or $C_kH_rF_s$ wherein j and k are each an integer between one and $(13-3(x+y+z))$, inclusive, and $j+k$ is an integer between two and $(13-3(x+y+z))$, inclusive, u and v are each an integer between zero and $2j+1$, inclusive, and $u+v=2j+1$, and r and s are each an integer between zero and $2k+1$, inclusive, and $r+s=2k+1$, and if k equals zero, then s equals zero;

R_{1-3} and R_{10-12} are independently $C_mH_nF_p$, where m is an integer between zero and two, inclusive, n and p are integers between zero and five, inclusive and $n+p=2m+1$;

R_{4-9} are independently H, F, CH_3 , CH_2F , CHF_2 , or CF_3 ; and

R' is O, S, carbonyl or ester, and if R' is O or S and j equals zero then v equals zero;

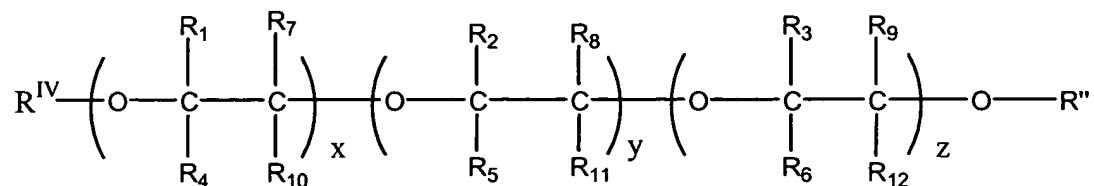
wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].

50. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

wherein the organic solvent is of the structural formula:

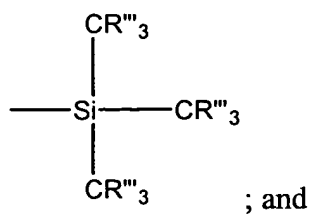
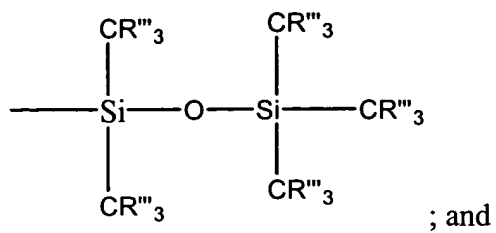


wherein x , y , and z are each zero or one;

at least one of x , y , and z is one;

R'' is selected from the group consisting of:

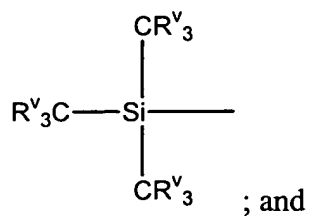
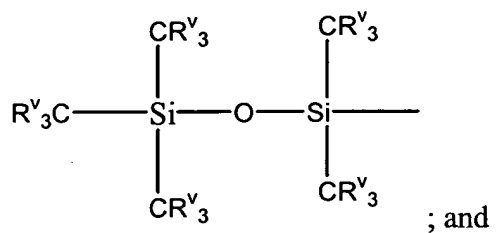
H;



wherein R^{III} is H, F or combinations of H and F;

R^{IV} is selected from the group consisting of:

H;



wherein R^V is H, F or combinations of H and F; and

when R^{II} is H or F, R^{IV} is not H or F;

R₁₋₃ are independently H, F, CH₃, CH₂F, CHF₂ or CF₃; and

R₄₋₁₂ are independently H or F;

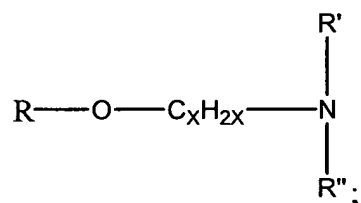
wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].

57. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

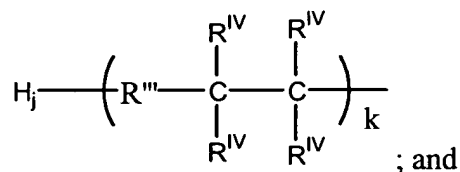
cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

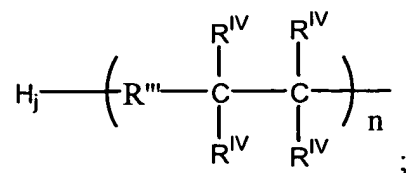
wherein the organic solvent is of the structural formula:



wherein R' is



R'' is independently



wherein R''' is O and j is 1 or R''' is N and j is 2;

n is an integer between zero and two;

R^{IV} are each independently H, CH₃ or CH₂CH₃ and k is an integer between zero and two inclusive; and

wherein R is C_yH_{2y+1} and y is an integer between one and (12 - (3k+3n+x)) inclusive, and x is an integer between one and (12-(3k+y)), inclusive;

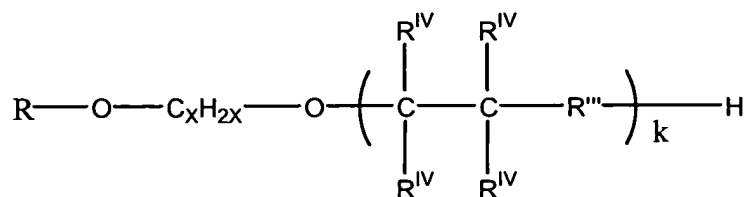
wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].

58. (Amended three times) A process for cleaning [substrates] a substrate selected from the group consisting of a textile, a flexible structure, a precision structure, a delicate structure, and a porous structure, comprising:

cleaning the [substrates] substrate by removing substantially all of a contaminant with at least one [an] organic solvent in absence of liquid carbon dioxide, the organic solvent comprising less than 50% by weight water; and

removing the organic solvent from the substrates using at least one [a] pressurized fluid solvent;

wherein the organic solvent is of the structural formula:



wherein R''' is O or NH;

R^{IV} are each independently H, CH₃ or CH₂CH₃ and k is an integer between zero and two inclusive; and

wherein R is C_yH_{2y+1} and y is an integer between one and (12- (3k+x)) inclusive, and x is an integer between one and (12-(3k+y)), inclusive;

wherein when the pressurized fluid solvent is liquid carbon dioxide, the liquid carbon dioxide is at a subcritical condition [under a pressure between approximately 600 pounds per square inch to approximately 1050 pounds per square inch].